REMARKS

Claims 1-13, 16-31, 33-36, 38-42, and 51-52 are currently pending. Claims 14, 15, 32, 37, and 43-50 are canceled.

1. The claims are restricted as being directed to distinct inventions: Invention I relating to claims 1-43 and 50-52 and Invention II relating to claims 44-49. Applicants elect Invention I relating to claim 1-43 and 50-52.

2. Claim 14 is canceled, rendering the rejection under 35 U.S.C. 112, second paragraph, moot.

3. Claims 1-13, 21, 23-31, 36, and 40-42 were rejected under 35 U.S.C. 102(b) as being anticipated by US 6,391, 442 (herein referred to as "Duvall"). Claims 1, 2, 6, 7, 10-14, 21-23, 25, 27, 28, 30, 31, 36, 40, 41, and 42 were rejected under 35 U.S.C. 102(b) as being anticipated by Bunyan et al (US 6,054,198). These rejections are moot in light of the incorporation of the subject matter of claim 15, 37, and 43 into independent claims 1, 36, and 42, respectively.

4. Claims 15, 18, 32, 34, 37, 39, and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Duvall further in view of Shikata et al. (US 6,255,376) and as being unpatentable over Bunyan further in view of Shikata et al. This rejection is respectfully traversed for the following reasons.

Claim 1 is directed to a thermal interface material including a polymer component, a phase change component mixed with the polymer component, and a non-ionic surfactant mixed with the polymer component and the phase change component. Claim 36 is directed to a thermal interface tape including a first layer comprising a conductive film and a second layer comprising a thermal interface material comprising a non-ionic surfactant and a phase change component. Claim 42 is directed to a microelectronic structure comprising an integrated circuit active device, a heat sink, and a thermal interface tape. The thermal interface tape includes a non-ionic surfactant and a phase change component and is disposed between and couples the integrated circuit active device and the heat sink to each other.

Duvall discloses a thermal interface material that includes thermally conductive filler particles dispersed in a phase change material. Bunyan is essentially equivalent to Duvall, and teaches a thermally-conductive interface material which is form stable at normal room temperature in a first phase and substantially conformable is a second phase to interface surfaces. The material has a transition temperature from the first phase to the second phase which is within the operating temperature range of an electronic component.

Duvall and Bunyan represent the very state of the art over which the claimed invention was developed, and each fails to teach or suggest a non-ionic surfactant. Since Duvall and Bunyan fail to teach or remotely suggest a non-ionic surfactant, the PTO has turned to Shikata et al. Shikata et al. teach a thermally conductive compound including polyethylene thermoplastic carrier resin, thermally conductive filler, and dispersing agent, such as glycerin fatty acid esters. While the PTO has taken the position that it would have been obvious to incorporate a dispersing agent into the materials of Bunyan or Duvall, Applicants submit that the references taken together as a whole fail to teach or remotely suggest combination of a non-ionic surfactant with a phase change component in the context of a thermal interface material.

Applicants have discovered that *combination* of non-ionic surfactant with a phase change component in the context of thermal interface materials unexpected results. Specifically, Applicants discovered that the combination of non-ionic surfactants and phase change components provides both improved peel strength and reduced thermal impedance. In particular, Applicants have discovered that the combination leads to significant increases in peel strength, as illustrated in Examples 1-5, which is advantageous for thermal interface tape embodiments. These improvements would not have been expected by one of ordinary skill and are indicative of the non-obviousness of the claimed invention. At best, Shikata et al. teaches that use of a dispersing agent improves filler dispersion homogeneity. Improvement in mechanical properties, such as peel strength, is nowhere recognized or even remotely suggested by the cited references. In addition, Applicants discovered that the combination of a non-ionic surfactant and a phase change component result in a reduced temperature difference between a heat source and a heat sink.

For at least the foregoing reasons, Applicants respectfully submit that claims 15, 18, 32, 34, 37, 39, and 43 are not unpatentable over Duvall or Bunyan in view of Shikata et al. Accordingly, reconsideration and withdrawal of the 35 U.S.C. §103 rejections are respectfully requested.

5. Claims 19, 20, 35, and 50-52 were rejected under 35 U.S.C. 103(a) as being unpatentable over Duvall or Bunyan.

Claims 19, 20 and 35 are dependent claims. Duvall and Bunyan fail to teach or suggest one or more elements of the claims from which claims 19, 20, and 35 depend, as described above. Therefore, for at least the foregoing reasons, Applicants respectfully submit that claims 19, 20, and 35 are not unpatentable over Duvall and over Bunyan. Claims 51 and 52, each reciting a non-ionic surfactant, are patentable for the reasons stated above.

For at least the foregoing reasons, Applicants respectfully submit that claims 19, 20, 35, 51 and 52 are patentable over Duvall and over Bunyan. Accordingly, reconsideration and withdrawal of the 35 U.S.C. §103 rejections are respectfully requested.

Applicants respectfully submit that the present application is now in condition for allowance. Accordingly, the Examiner is requested to issue a Notice of Allowance for all pending claims. Should the Examiner deem that any further action by the Applicants would be desirable for placing this application in even better condition for issue, the Examiner is requested to telephone the Applicants' representative at the number listed below.

The Commissioner is hereby authorized to charge any fees, which may be required, or credit any overpayment, to Deposit Account Number 50-2469.

Respectfully submitted,

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Date

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